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DISTRIBUTOR DEVICE FOR UNSET CONCRETE 10 08 MAR 2006Cross Reference to Related Application

[0001] This application is a **national stage** of PCT/EP2004/009553 filed August 27, 2004 and based upon DE 103 41 829.6 filed September 9, 2003 under the International Convention.

BACKGROUND OF THE INVENTIONField of the invention

[0002] The invention concerns a distributor device for unset concrete, the device including a conduit which on the inlet side is connectible with the pressure outlet of a concrete pump and which includes a delivery conduit which can be moved to a concreting point via a manipulator or actuator device.

SUMMARY OF THE INVENTION

[0003] Distributor devices of this general type are known, in which the actuating device is the delivery part of the articulated or telescopic boom on which the conveyor conduit is carried, wherein the telescopic boom and a concrete pump are provided on a common stationary or mobile chassis. Therein, the pressure outlet of the concrete pump and the inlet side of the conduit conducted along the boom are fixedly associated with the chassis. The conduit conducted along the distribution boom does make it possible to move the emission point of the unset concrete to points distant from the material outlet location of the concrete pump. It is however frequently the case that the concrete distribution boom cannot reach, with its end hose, certain narrow or shielded areas, such as elevator shafts or structural support areas. Further, the reach of the distribution boom is frequently not sufficient to cover a larger construction area; this above all, when the sub-stratum in the area of the construction site is too weak for driving upon with a massive concrete pump.

[0004] Beginning therewith, it is the task of the invention to develop a distributor device for unset concrete, via which the range of the conveyor conduit can be extended into otherwise inaccessible areas of the construction site.

[0005] Advantageous embodiments and further developments of the invention can be seen from the dependent claims.

[0006] The inventive solution is comprised primarily in having the outlet part of the conveyor conduit, together with the associated actuating device, provided on a self-propelled chassis, separate from the concrete pump, with the inlet side of this outlet part of the conveyor conduit being connectible, via an at least partially flexible intermediate conduit, with the pressure outlet of the concrete pump. This chassis thereby is provided with a motor propelled frame. It can be controlled, together with the actuating device and the concrete pump, by a wireless remote control. Advantageously the vehicle chassis includes a driver cabin or cockpit as well as control elements for controlling the movement of the vehicle and the actuating device. The vehicle chassis can have a chain drive or caterpillar track or can have wheels. In order to have a stable stance while distributing concrete, supplemental supports struts could be provided, in order to support the chassis upon the substrate by relieving the load on the chassis or even lifting the chassis from the ground.

[0007] A preferred embodiment of the invention envisions that the outlet part of the conveyor conduit include at least three sequentially arranged pipe pieces, connected via articulated linkages to be pivotal relative to each other about horizontal articulation axis by motor or hydraulic means; of which the inlet-end pipe piece is fixed to the vehicle chassis and is, on its inlet end, connectible via the intermediate conduit to the concrete pump, and of which an outlet-end pipe piece includes an outlet opening and, in certain cases, a terminal hose connected thereto. The vehicle chassis-fixed pipe piece is preferably horizontally oriented in the direction of forward motion of the vehicle chassis. According to a particularly simple construction solution, the pipe pieces exhibit on their ends facing each other respectively a pipe elbow and an articulated linkage with horizontal axis for rotation. In this design, the actuating device includes a coupling strut fixed to an offset projecting from the middle pipe piece for supporting one end

of two respective end of two actuating cylinders, which with their other, relative to the respective first displaceable end, are coupled with the adjacent pipe piece. The moveable intermediate conduit can either be in the form of a flexible hose, which can be rolled or unrolled, or bent for lengthening or shortening. A preferred embodiment of the invention envision that the intermediate conduit is at least partially formed of pipe pieces joined preferably pivotably with each other along vertical scissors axis for lengthening or shortening. The intermediate conduit could also be connected to an outlet of the pipe conduit of the distribution boom connected to the mobile concrete pump or a stationary concrete pump. In the case of a stationary pump, the intermediate conduit could be connected to the outlet of a stationary conduit connected with the concrete pump.

[0008] The low weight of the inventive concrete distributor device makes it possible that it can be transported on a platform of a mobile concrete pump. Essentially, for this, a trailer that can be coupled to a vehicle could also be employed.

[0009] The invention is besides this concerned with a mobile concrete pump with a vehicle chassis and a conveyor conduit directed along a distribution boom, wherein in accordance with the invention a receptacle is provided on a platform of the mobile concrete pump for the transport of the mobile distributor device. The platform includes, for this purpose, a lift or jack for the raising and lowering of the mobile distributor device. Preferably the distribution boom is employed as the lifting device for the mobile distributor device, for which for this purpose a gripper or hook device can be provided. Basically, as lift means, also a crane or a ramp which could be driven up could be provided. For weight purposes the mobile distributor device could also be in a form in which it can be disassembled.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] In the following the invention will be described in greater detail on the basis of an illustrative example shown schematically in the figures. There is shown:

Fig. 1 a side view of a mobile concrete pump with a receptacle provided on its chassis for a mobile distributor device in transport condition;

- Fig. 2a, b, c a side view, a rear view and a top view of the mobile distributor device with folded-in pipe distributor;
- Fig. 3a, b a side view and a top view of an embodiment differing from that of Fig. 2a through c of a mobile distributor device in operating condition.

DETAILED DESCRIPTION OF THE INVENTION

[0011] The distributor device as shown in the figures includes a chassis 14 provided with a motorized caterpillar tread 12, which chassis carries a driver cabin 16 and is supportable upon the substrate 20 via four hydraulic actuated support legs 18 accompanied by lifting and lowering the chassis 12. The distributor device 10 includes a chassis-fixed pipe piece 22, a middle pipe piece 26 linked to the outlet end of the chassis-fixed pipe piece and pivotable about a horizontal axis at an articulated linkage 24 as well as a outer pipe piece 30 connected to the middle pipe piece 26 via a further articulated linkage 28 and pivotable about a horizontal articulation axis. The pipe piece 30 carries, in the illustrated example according to Fig. 2a through c, an end hose 32 and, in the illustrated embodiment according to Fig. 3a and b, an extension piece 34. The articulated linkages 24, 28 are respectively formed by two preferably ninety-degree pipe elbows 36 pivotable relative to each other about the articulated linkage. The two pivotable pipe pieces 26, 30 are actuated via the hydraulic cylinders 38, 40, of which the end linkages are linked to pipe-fixed extensions or projections 42, 44, 46, 48. The actuation of the hydraulic cylinders 38, 40 is controlled either manually from the driver cabin 16 or via a suitable remote control.

[0012] The outlet part of the conveyor conduit comprised of the pipe group 22, 26, 30 is connected to the concrete pump via a moveable or flexible connecting or intermediate conduit 50 as well as an inlet part 54 of the conveyor conduit mounted fixedly on a support mount 52 not shown in Figs. 3a and b. The moveable connecting pipe 50 allows the distributor device 10 to move with its vehicle chassis 12 on the construction site ground 20 to a location to be concreted relative to the concrete pump. In the illustrated embodiment shown in Figs. 3a and b the moveable intermediate conduit 50 comprises two scissors-like pipe pieces 56, 58 pivotable relative to each other via articulated linkages 60, 62, 64 with vertical rotation axis, coupled to the chassis-fixed pipe piece 22 and the pump side inlet part 54 pivotable relative to each other. The rotateable linkages 60, 62, 64 include respectively two pipe elbows 66 joined to each other

to be rotateable about the associated linkage axis. The pivoting of the rotation linkages 60, 62, 64 occurs automatically upon movement of the distributor device 10 relative to the inlet side pipe group 54.

[0013] The inlet-side pipe group 54 can be a component of a mobile concrete pump 68 (Fig. 1), wherein the pipe pieces of the inlet pipe group 54 of the conveyor conduit are conducted along distribution boom 70 in the form of an articulated boom. The mobile concrete pump 68 includes a two-cylinder thick matter pump 72 with material supply container 74, which is operated by hydraulic drive cylinders 76 and of which the pressure outlet 78 is connected with inlet part 54 of the conveyor conduit which is conducted along the distribution boom 70. In the illustrated embodiment shown in Fig. 1 the platform 80 of the mobile concrete pump 68 includes a receptacle 82, in which the mobile distributor device 10 can be placed for transport purposes. The hydraulic operated distribution boom 70 can be employed for loading and unloading the distributor device 10.

[0014] With the above-described measures the reach of the distribution boom 70 of the mobile concrete pump 68 can be substantially extended on the construction site. In particular the mobile distributor device 10 has access also to locations within the construction site not accessible via the distribution boom 70. Due to its relatively low weight the distributor device 10 can be driven directly to the area of the construction site to be concretized. It can work without having its own concrete pump and without a material supply container.

[0015] In summary the following can be concluded: The invention relates to a distributor device for unset concrete. The distributor device comprises a delivery conduit that can be connected to the pressure outlet 78 of a concrete pump 72 on the inlet side and is provided with an outlet part (tube pieces 22, 26, 30) that can be moved to a concreting point via a manipulator (hydrocylinder 38, 40). According to the invention, the outlet part of the delivery conduit is arranged, with the associated manipulator, on an automotive chassis 44 that is separate from the concrete pump 72, and can be connected to the pressure outlet 78 of the concrete pump 72, on the inlet side, by means of an at least partially mobile connecting conduit 50.